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OMRON

NT20 NEW
NT31/31C-V3
NT631C-V3

Series

Better SYSMAC Compatibility and Easier-to-use Support Software

NT SERIES

realizing

Providing What's Needed in Programmable Terminals

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Feel the change more!

NT-series
Support Software
Version 4

SYSMAC PLCs

NT631C Version 3

NT31/31C Version 3

NT20

The Simple Design and Easy Operation That Users Need. Reduced TCO* throughout On-site System Construction and Maintenance.

To keep in pace with the progress of information technology on production sites, more advanced and more diversified functions are continuously required from operator interfaces. OMRON continuously researches the use of operator interfaces at all stages of application. OMRON scrutinizes system compatibility, design efficiency, operability, and maintenance, and helps reduce the TCO for the introduction, maintenance, and management of systems.
The NT Series of Programmable Terminals ever continues to improve functionality from the users' perspective.
*TCO (total cost of ownership)

Improved SYSMAC Compatibility 6
Device monitoring and I/O comment loading functions facilitate system construction.

Easier Screen Creation and Better Design Efficiency 8
Greatly enhanced NT Support Software with reusable screen data and powerful simulation on editing screens.

Easier On-site Maintenance 10
Transfer the system program and screen data to ensure smooth on-site system maintenance and improve the efficiency of on-site work.

Wide Range of Communications Interfaces 12

PT
Programmable Terminal

A Lineup of Models with Versatile Display Features and Easy Operation

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The lineup includes one large, two medium-size, and one small PT with different display devices.
The functions and operability of all models are unified, making replacement with another model easy.
Screen data from previous models can be used for all large, medium-size, and small PT models in the series.

			NT631C-ST153(B)-EV3		NT31C-ST143(B)-EV3	NT31-ST123(B)-EV3	NT20-ST121(B)
Model							
Display			TFT color display		STN color display	STN monochrome monochrome display	STN monochrome display
Effective display area			211 x 158 mm		118 x 89 mm		111.5 x 57.6 mm
Number of dots (resolution)			640 x 480 dots		320 x 240 dots		256 x 128 dots
Max. number of touch switches			32 x 24 switches		16 x 12 switches		12 x 6 switches
External interface			RS-232C, RS-422A, RS-485, and printer port				2 RS-232C ports
Applicable standards			cULus standards, EC Directives, and C-Tick				
Connectable hosts	From OMRON (See note 1.)	1-to-1 NT Link	C200HX(-Z), C200HG(-Z), C200HE(-Z), C200HS-CPU2□, and C200HS-CPU3□		CQM1-CPU4□, CPM1A, CPM2A/C, SRM1, CVM1/CV Series (EV1 or EV2), and C200HX/HG/HE Communications Boards		
		1-to-N NT Link	CJ1□, CS1H, CS1G, C200HX(-Z), C200HG(-Z), C200HE(-Z), and SRM1-EV2		CS1 Communications Unit and CQM1H Communications Board		
		High-speed NT Link			CJ1□, CS1H and CS1G		
		Host Link	CJ1□(-H), CS1□(-H), C200HX(-Z), C200HG(-Z), C200HE(-Z), C200HS-CPU2□, C200HS-CPU3□ and CS1Communications Units		CQM1-CPU4□, CQM1-CPU2□, CPM1A, CPM2A, CPM1C, SRM1, CVM1, CV series (EV1 or EV2), C-series/CV-series/CVM1 Host Link Unit		
		Memory Link			Personal Computer, SBC, and Programmable Controller		Personal computer, SBC, or PLC (RS-232C) (See note 5.)
	From Mitsubishi	Mitsubishi FX Series			MELSEC FX1, FX2, FX2C, FXO, and FXON		
		Mitsubishi A-Series (Computer Link Unit)			AOJ2-C214S1, A1SJ71UC24-R2, A1SJ71UC24-R4, and AJ71UC24		
	Allen Bradley (DE1)				SLC 5/02, 03, 04, and 05 (See note 2.)		——
	GE-Fanuc (SNP-X)				90-20 and 90-30 Series (See note 2.)		——
	Siemens (Via HMI Adapter)				S7-300 and S7-400 Series (See note 2.)		——
Language	Japanese						
	English						
	Simplified Chinese (See notes 3, 4, and 5.)						
	Traditional Chinese (See note 3.)						——

Note 1: There are some limitations on hosts that can be connected. Refer to the PT manual for details. C200H direct connections can be used with the NT20-ST121 (using the NT20-IF001).
2: The English version of the NT Support Tool must be used.
3: Simplified Chinese is mostly used in mainland China and uses simplified characters. Traditional Chinese is mostly used in Hong Kong and Taiwan and uses traditional characters.
4: Purchase the NT20-ST121(B)-EC to display simplified Chinese on the NT20.
5: A separate system program must be installed in the NT20 to use RS-232C memory links with the NT20. Simplified Chinese is not supported.

Improved SYSMAC Compatibility for Easier System Construction

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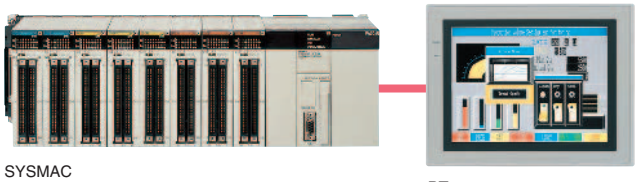
Programming Console and Device Monitor Functions

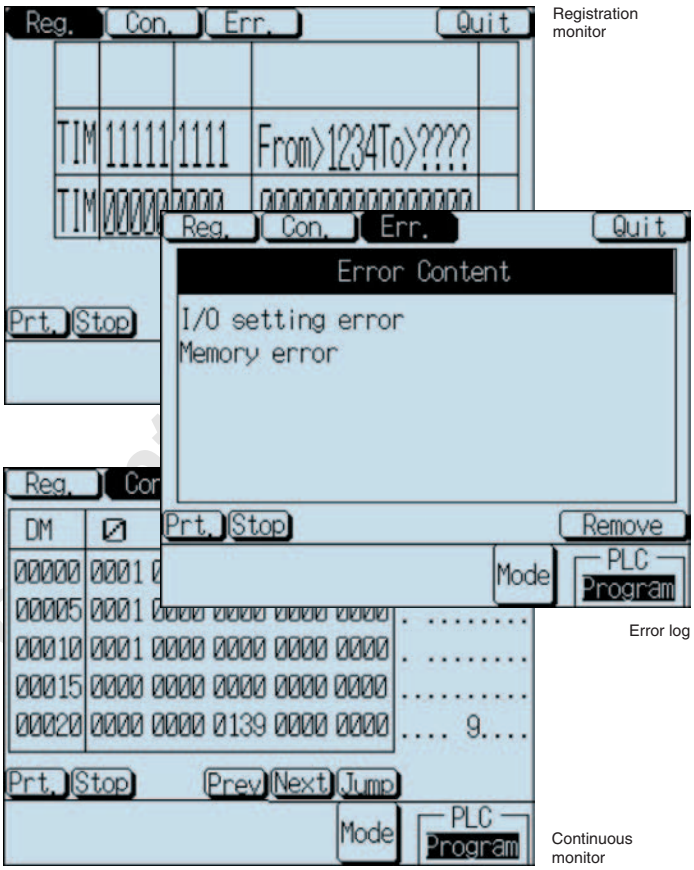
[Device Monitor]

NT631 NT31

The device monitor function makes it possible to read and write I/O memory data and display consecutive sections of PLC data areas. This function greatly improves the efficiency of PLC setup work, including set value input into the Special I/O Units and checks on the settings. Data can be read from I/O memory from a user-created screen to enable application on maintenance screens for monitoring.



SYSMAC PT



Registration monitor

Error log

Continuous monitor

[Programming Console Functions]

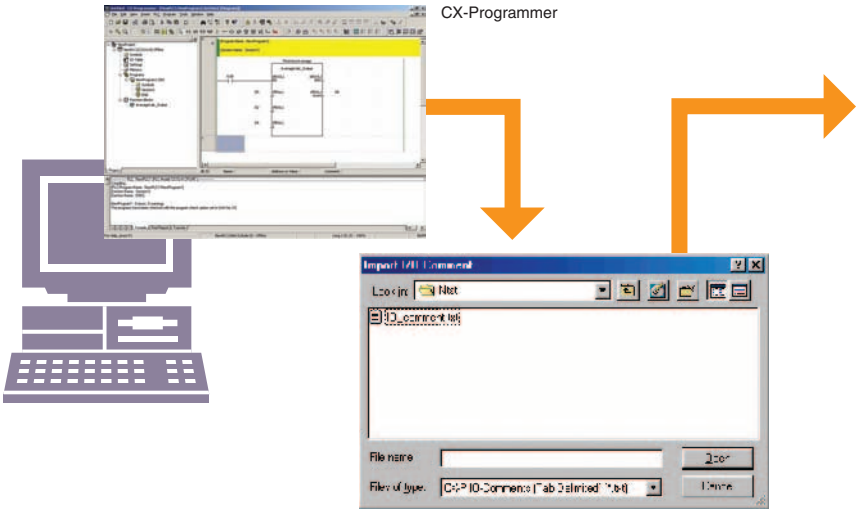
NT631 NT31

C-series and CS/CJ-series ladder programs can be written and read in mnemonic form through the NT631/NT31 screens for easy on-site system maintenance.

I/O Comments Can Now Be Imported

NTST-V4 NT631 NT31 NT20

I/O comments can now be imported from ladder program files, such as CX-Programmer files. Imported I/O comments can be used as labels to eliminate the bother of entering comments. This also prevents I/O allocation mistakes between the PT and PLC, and reduces the time required to correct such mistakes.



CX-Programmer

Import I/O Comment Dialog Box

PT

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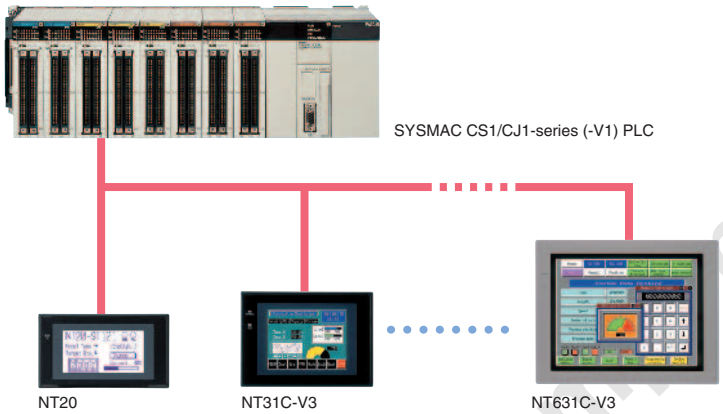
Full-area Access to SYSMAC CS1/CJ1-series PLCs over High-speed NT Link

NT631 NT31 NT20

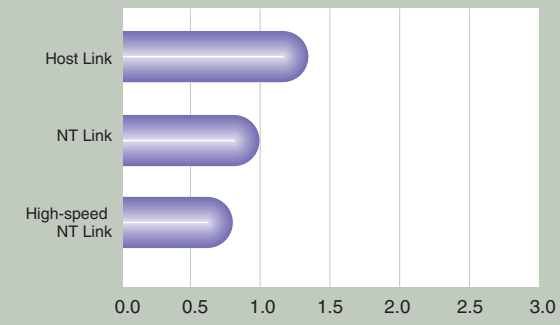
Connect to SYSMAC CS1/CJ1-series PLC over High-speed NT Link

- The industry's highest serial communications speed.
- Up to eight NT631/NT31/NT20 Units can be connected to a single port.
- Extends to a maximum of 500 m.
- Essentially the same performance is achieved for NT Links with eight PTs as for an NT Link with a single PT (for refreshing numeric displays).

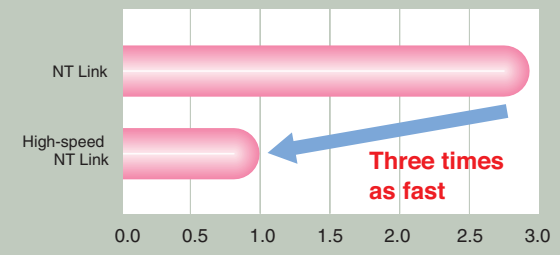


OMRON Data Comparison

Response Speed for Communications with Single PT Connected



Response Speed for Communications with Eight PTs Connected



All data was measured at the RS-232C port of the CPU Unit with the response speed for a single NT Unit connected taken as 1.

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Easier Screen Creation and Better Design Efficiency with Improved Support Software

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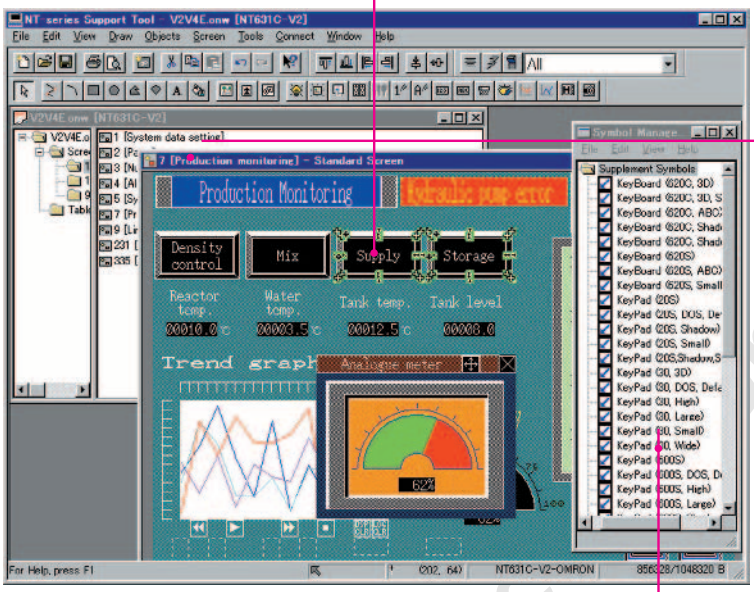
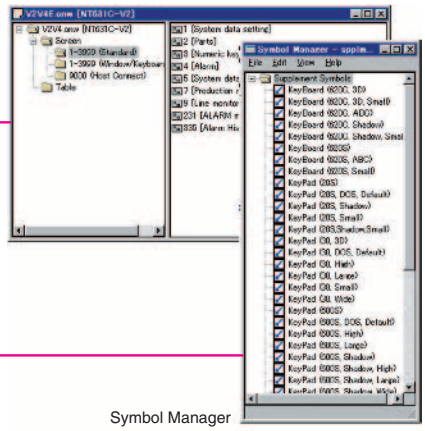
Unified Screen Creation Environment with the NTST NT Support Software

Windows Look and Feel environment ensures easy operation, allowing anyone to create screens quickly and easily.
The enhanced ON/OFF simulation function of the NT631/NT31/NT20 and easy application of existing screen data accelerate product development and designing.



Edit screen

- The arrow keys on the keyboard are used to move objects dot by dot.
- Displays object and cursor coordinates.
- The window being manipulated can be displayed or not displayed.
- Zooms up to 800%.



Application Manager

Symbol Manager

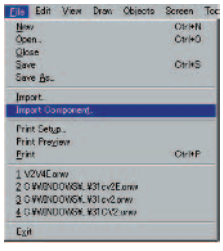
(The NT631, NT31, and NT20 are supported by NTST-V4.)

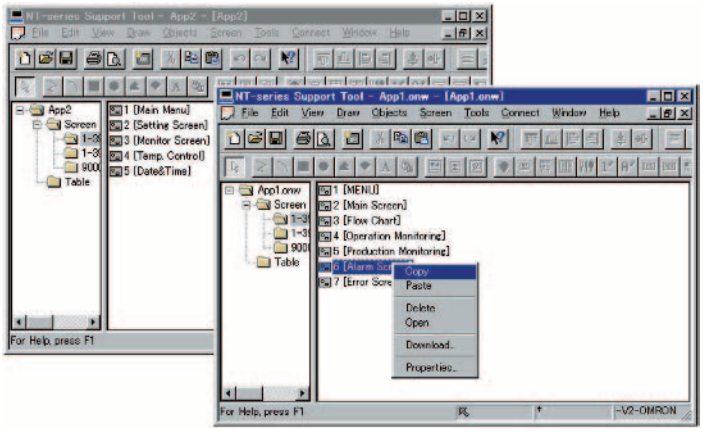
Easier Application of Existing Screen Data

It is possible to load screens and tables independently from different screen data files.
The NT631/NT31/NT20 can now use existing screen data efficiently.

Improved Compatibility with NT30 and NT620 Series

- Image and library data coding.
- Image and library data insertion into character strings.
- The word configuration and functions for the NT631/NT31/NT20 status control area and notification area.





System Requirements

- CPU: Pentium 100 MHz min.
- RAM: 32 MB min.
- Hard disk
  Software capacity: 17 MB
  Installer: 3 MB
  Sample objects: 32 MB
- OS: Windows 95, 98, 2000, NT 4.0, Me, or XP
- Media: CD-ROM

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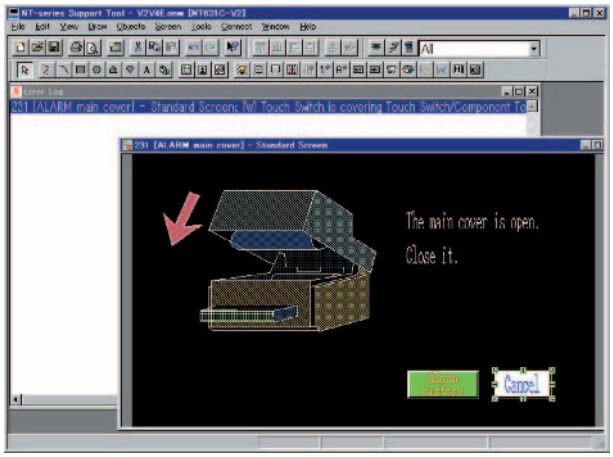
Complete Functions in NT Support Software

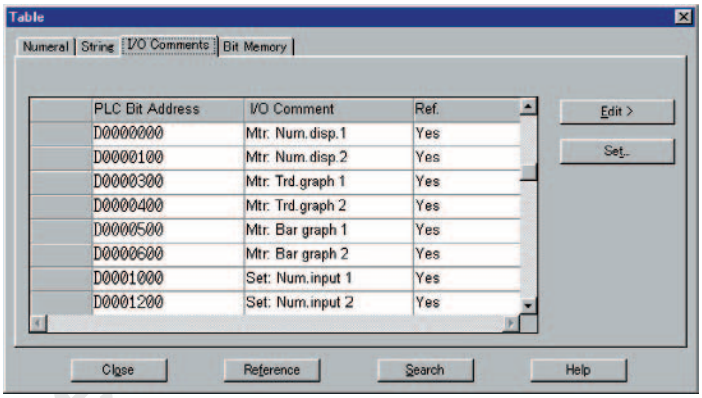
Error Log Viewer

Double-click the error message to track down the error on the screen.



I/O Comment Table

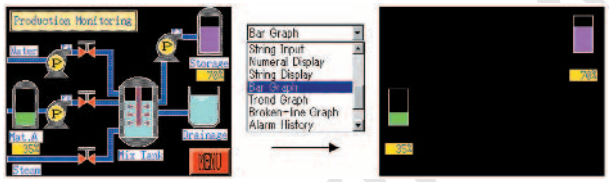
All PLC addresses and I/O comments can be managed together. Addresses that have been allocated are automatically registered in the I/O comment table.



I/O Comment Table

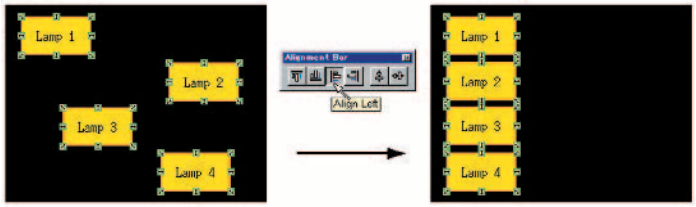
Filter

The filter function makes editing easier by displaying only the objects you select for modification.



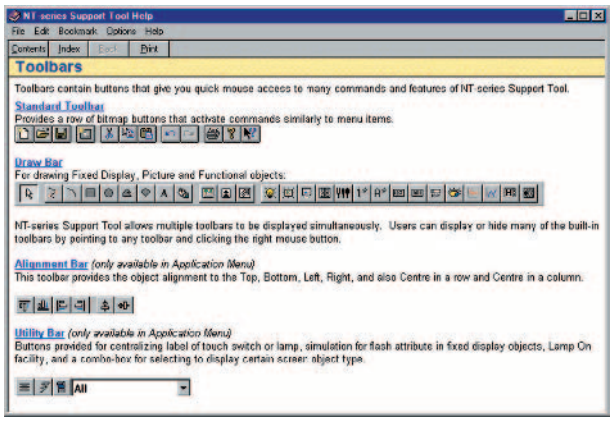
Object Alignment

Objects can be top-, bottom-, left-, right-, or center-aligned automatically.



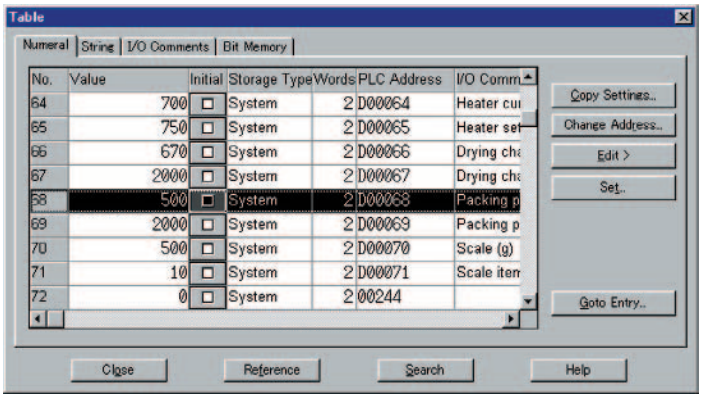
Online Help

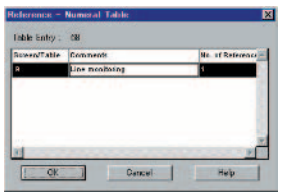
Click the Help icon whenever you are not sure how to proceed. The information you need will appear by touching the objects on the screen.

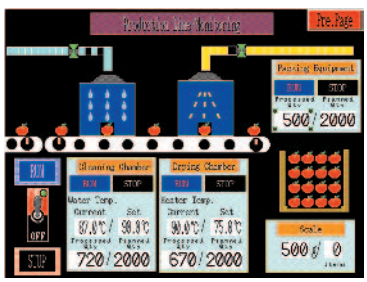

NT series Support Tool Help
Toolbars
Toolbars contain buttons that give you quick mouse access to many commands and features of NT-series Support Tool.
Standard Toolbar
Draw Bar
Alignment Bar (only available in Application Menu)
Utility Bar (only available in Application Menu)

Help

Search Function







It is possible to jump from an I/O comment table address to the screen where the object is located.

Easier, More Efficient On-site Maintenance.

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Increased Backlight Life for Maintenance-free Operation

NT631 NT31 NT20

The Backlight Module has been redesigned to eliminate the need to replace the Backlight and enable maintenance-free operation for up to 50,000 hours.

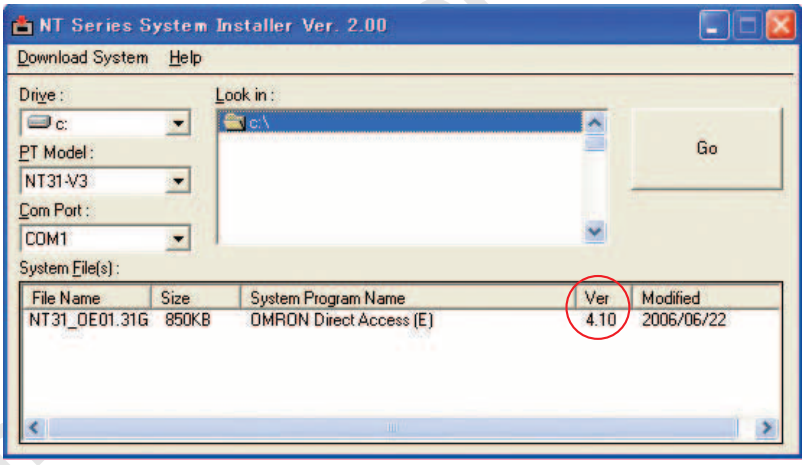
System Program Transfer

NT631 NT31 NT20

By transferring a new system program, functions and performance can be updated without changing hardware.

The following system programs are provided.

- OMRON (Memory Link) and Mitsubishi versions for NT31/631
- OMRON, Mitsubishi, and Memory Link versions for NT30/620
- OMRON, Mitsubishi, and Memory Link (RS-232C) versions for NT20



System installer

1) The compatible combinations of NT31/631 models and system program versions are shown in the table.

◎ : Indicates the preinstalled default combination of versions (recommended).
○ : Indicates combinations of versions that can be transferred for operation.
△ : Indicates combinations of versions that can be transferred but for which some functions are restricted during operation (e.g., high-quality character display).
× : Indicates combinations of versions that cannot be transferred.

2) NT31/631 system program version 4.x can be transferred only with System Installer V2, which is available on the CD for NT Series Support Software version 4.08 or higher. Only system programs up to version 3.x can be transferred with older versions of the System Installer.

3) The NT20 system program can be transferred only with System Installer V2.1, which is available on the CD for NT Series Support Software version 4.8 or higher. It cannot be transferred with lower versions of the System Installer.

System (See note.) \ PT	Pre-V1	-V1	-V2	-V3
Ver. 1.x	◎	○	○	×
Ver. 2.x	△	◎	○	×
Ver. 3.x	△	○	◎	×
Ver. 4.x	×	×	×	◎

Note: The system version is shown in the System Installer program under "Ver." (circled in red in the above diagram).

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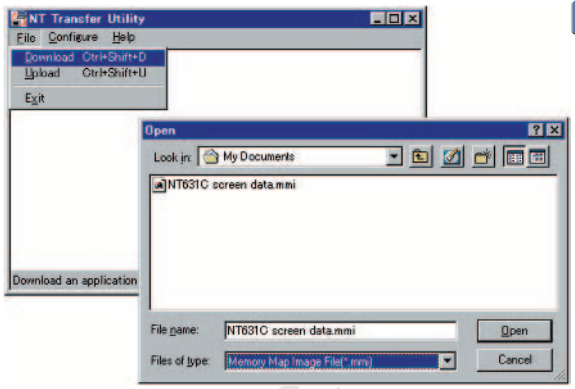
Special Utility to Transfer Screen Data

NT631 NT31 NT20

It is possible for anyone to easily transfer screens by using a special software application instead of the NT Support Software. The software application can be set up separately.
The NT20 system program can be transferred using the transfer utility provided with NT Support Software version 4.8 or higher. Change the setting to "NT20S" if using the transfer utility provided with Support Software version 4.0□ or lower.



Supports Wide Variety of Language Input

NT631 NT31 NT20

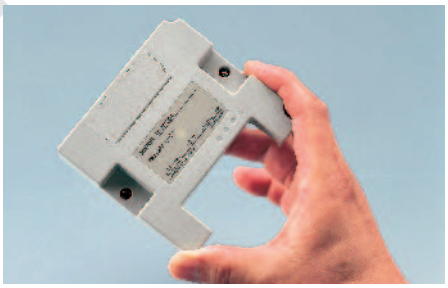
European and English languages are supported. (The English version of the NT Support Software is used.) Furthermore, Simplified and Traditional Chinese are supported. (The NT Support Software uses specifications for all languages.) Contact your OMRON sales representative for details.

Note: Traditional Chinese is supported only by NT31/631.

Memory Unit for Easy and Immediate Screen Data Transfer

NT631 NT31 NT20

Simply attach the Memory Unit to the back of the NT631/NT31/NT20 to easily transfer screens. Up to two banks can be registered and both system programs and screen data can be transferred.



Check Screen Data without Programmable Controller

NT631 NT31

The NT631/NT31 displays screens, such as lamps, touch switches, and memory table numbers, without the PLC connected, to enable efficient debugging.

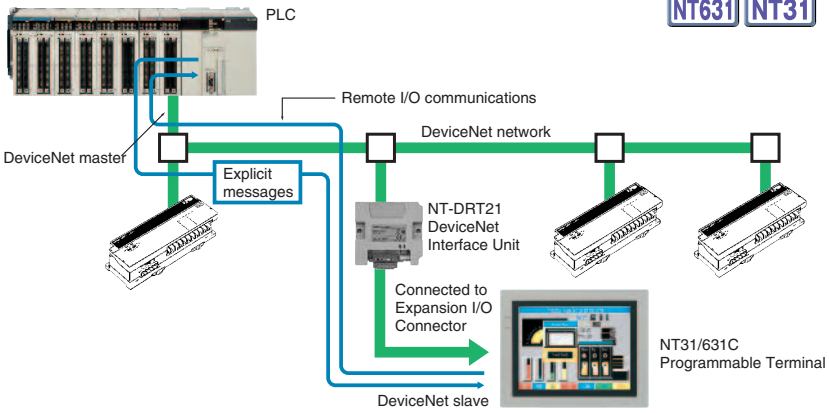
Connect as a DeviceNet Slave

NT631 NT31

NT-DRT21
DeviceNet Interface Unit

DeviceNet compatibility means even greater standardization.
Both I/O allocations and message communications are supported. With a DeviceNet Interface Unit mounted, version 1 or older versions of the NT631/31 can also be connected to a DeviceNet network.

■ **Connections**



Wide Range of Communications Interfaces

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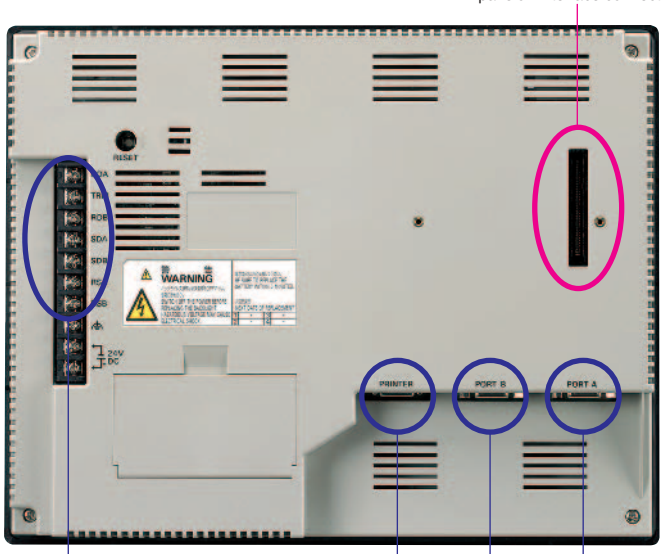
NT631 Series

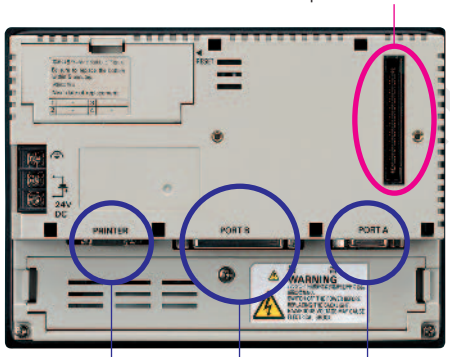


RS-422A Port
Ensures 1-to-N RS-422A or RS-485 communications, as well as long-distance communications.

Printer Port

RS-232C Port
The NT631 has two RS-232C ports that can be connected directly to bar-code readers for POP system construction. These two ports can be used simultaneously for the Support Software and host, to greatly improve debugging and maintenance efficiency.

NT31 Series

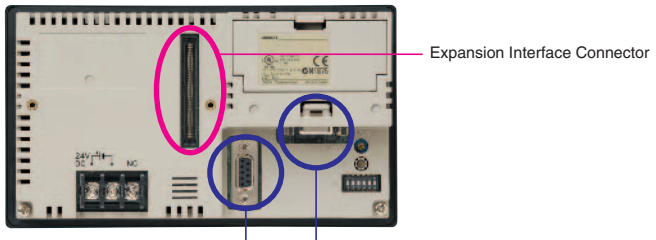


Printer Port

RS-232C Port

RS-232C/RS-422A Port
(RS-232C selectable by memory switch setting.)

NT20 Series



RS-232C port
(used for both Support Software and host)

RS-232C port
(host communications only)

Debugging and maintenance is more efficient using two ports.

Flat, Thin-profile Model Only 54 mm Thick

All models have flat, smooth surfaces and are only 54 mm thick, which is ideal for space-saving designs built into equipment.

Equivalent to the IP65 Oil-proof Standard Ensures a High Degree of Resistance to the Environment.

The NT631/NT31 has a flush-surface construction and is highly resistive to severe operating environments. The front panel conforms to IP65F oil-proof type.

IP: International Protection
6 : Resistant to dust (protected from solid objects)
5 : Resistant to water spray from any direction (protected from water immersion)
Oil-proof type: Resistant to oil drops or sprayed oil

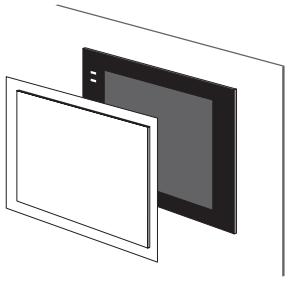
The NT631/NT31 cannot be used in locations where it will be subjected to oil spray over a long period of time.

Conformity to Standards Ensures Suitability for Exports

The NT631/NT31 conforms to UL/CSA standards and EC Directives.

c UL us CE C-Tick

Protective Cover Added to Maintenance Parts



Material	Polyester film
Mounting method	Double-sided tape

The Protective Cover protects the surface of the Display from oil, dust, or fingerprints.

Specifications

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NT631C

■General Specifications

Item / Model	NT631C-ST153(B)-EV3
Rated power supply voltage	24 VDC
Allowable power supply voltage range	20.4 to 26.4 VDC (24 VDC –15%/+10%)
Power consumption	18 W max.
Ambient operating temperature	0 to 50°C
Storage temperature	–20 to 60°C
Ambient operating humidity	35% to 85% (with no condensation)
Ambient operating environment	No corrosive gases
Noise immunity	Conforms to IEC 61000-4-4 at 2 kV (power supply line).
Vibration resistance (during operation)	5 to 9 Hz, single amplitude: 3.5 mm 9 to 150 Hz, 9.8 m/s² 10 times (1 octave/min) each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s², 3 times each in X, Y, and Z directions
Weight	2.5 kg max.
Degree of protection (front panel)	Equivalent to IP65 oil-proof type and NEMA4 (See note.)

Note: The equipment cannot be used for long periods of time in locations which expose the panel to spills of oil.

■Display/Panel Specifications

Item / Model			NT631C-ST153(B)-EV3
Display	Display device		Color TFT LCD
	Number of dots (resolution)		640 dots (horizontal) x 480 dots (vertical)
	Effective display area		211 x 158 mm (10.4 inches)
	View angle		Up: 35° Down: 65° Left: 60° Right: 60°
	Display color		8 colors (intermediate colors can be displayed in tiling patterns)
	Service life		50,000 hours (until contrast is reduced by 50%)
	Automatic turn-OFF		1 to 255 minutes/None
Backlight (cold cathode tube)	Service life when brightness is set to high)		50,000 hours min. (See note.)
LED	POWER	Green	Lit while power is being supplied.
	RUN	Green	Lit during operation
		Orange	Lit when the battery voltage is low (when operating)
		Red	Lit when the battery voltage is low (when stopped)

Note: The time until brightness is reduced by half, under normal temperature and normal humidity.

■Operation Specifications

Item / Model		NT631C-ST153(B)-EV3
Touch panel	Number of switches	768 (32 x 24)
	Input	Pressure sensitive
	Operating force	1 N max.
	Service life	1,000,000 operations min.

■External I/F Specifications

Item / Model		NT631C-ST153(B)-EV3
Serial communications	Serial port A	Conforms to EIA RS-232C. D-sub 9-pin connector (female) +5 V (250 mA max.) output at pin No. 6
	Serial port B	EIA RS-232C, (RS-422A/485 selectable by memory switch setting) RS-232C: D-sub 9-pin connector (female) RS-422A/485: Terminal block (6 terminals)
Parallel I/F		Conforms to Centronics specifications, 20-pin half-pitch connector
Expansion I/F		Dedicated connector

■Display Specifications

Item / Model		NT631C-ST153(B)-EV3
Display elements	Character displays (fixed display)	65,535 per screen (including marks)
	Graphic displays	
	Character string displays	Up to 256 per screen (40 bytes (40 characters) per string)
	Numerical displays	256 per screen, max. 10-digit display (2 words)
	Bar graph displays	Up to 50 per screen, percentage display and sign display are possible
	Analogue meter	Up to 50 per screen, percentage display and sign display are possible.
	Trend graphs	One frame per screen, 50 graphs per frame (only 8 graphs per frame with data logging)
	Broken line graphs	One frame per screen, 256 graphs per frame, 512 points per graph
	Lamps	Up to 256 per screen
	Image library displays	Up to 256 per screen
	Touch switches	Up to 256 per screen, Max. overlap: 256 mesh
	Numeral inputs	Up to 256 per screen
	Thumbwheel switches	
	Character string inputs	Up to 256 per screen
	Alarm lists	Up to 4 groups per screen
	Alarm histories	
Screen types	Normal screen	The normal screen display
	Overlapping screens	A maximum of 8 registered screens can be displayed overlapped with each other.
	Window screens	Up to 3 screens (2 local windows and 1 global window) can be displayed at the same time.
	Display history screens	Order of occurrence (max. 1,024 screens), order of frequency (max. 255 times)
Screen attributes		Buzzer, display history, background color, backlight, keyboard screen number
Number of screens	Max. number of registered screens	3,999 screens
	Screen No.	0: No display 1 to 3999: User-registered screens 9000: "Initializing system" screen 9001: Display history (occurrence order) screen 9002: Display history (frequency order) screen 9020: Programming Console function screen 9999: Return to the previous screen 9021 to 9023: Device monitor
Screen registration method		By transmitting screen data created using the Support Tool to the NT631C By transmitting screen data stored in a memory unit to the NT631C
Screen saving method		Flash memory (screen data memory in the PT)

■Display Element Specifications

Item / Model	NT631C-ST153(B)-EV3
Display characters	Half-size characters (8 x 8 dots): Alphanumerics and symbols Normal-size characters (8 x 16 dots): Alphanumerics and symbols Mark data (16 x 16 dots): User defined picture characters
Enlargement function	Normal size, double width, double height, and magnifications of 4X, 9X, 16X, 64X
Smoothing processing	Available for enlarged characters with magnification of 4X or greater (excluding marks)
Character display attribute	Normal, reverse, flashing, reverse and flashing, transparent
Image data	Variable-size pictograph Size: Min. 8 x 8 dots, Max. 640 x 480 dots The size can be set in 8-dot units. It is not possible to set enlarged display, smoothing processing, or display attributes such as reverse/flashing.
Library data	Combination of any characters and graphics Size: Min. 1 x 1 dots, Max. 640 x 480 dots Any size can be set. Enlarged display, smoothing processing, and display attributes such as reverse/flashing are displayed according to the setting registered.
Graphics	Polyline, circle, arc, fan, square, polygon
Line type	Solid line, dotted line, alternate long and short dash, long and two short dashes (only polylines for other than solid lines)
Tilling	10 types
Graphic display attribute	Normal, flashing, reverse, reverse flashing
Display colors	8 colors (black/blue/red/purple/green/light blue/yellow/white)

■Data Capacities

Item / Model	NT631C-ST153(B)-EV3
Screen data capacity	1 MB
Numeric memory table	2 words x up to 2,000 (1,000 tables can be backed up with battery)
Character string memory table	40 normal-size characters x up to 2,000 (Data can be written to and read from 500 tables)
Bit memory table	1 bit x 1,000
Mark data	224 (16-by-16-dot basis)
Image data	4,095 items
Library data	12,288 items

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NT31/NT31C

■General Specifications

Item \ Model	NT31-ST123(B)-EV3/NT31C-ST143(B)-EV3
Rated power supply voltage	24 VDC
Allowable power supply voltage range	20.4 to 26.4 VDC (24 VDC –15%/+10%)
Power consumption	15 W max.
Ambient operating temperature	0 to 50°C
Storage temperature	–20 to 60°C
Ambient operating humidity	35% to 85% (with no condensation)
Ambient operating environment	No corrosive gases
Noise immunity	Conforms to IEC 61000-4-4 at 2 kV (power supply line).
Vibration resistance (during operation)	5 to 9 Hz, single amplitude: 3.5 mm 9 to 150 Hz, 9.8 m/s² 10 times (1 octave/min) each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s², 3 times each in X, Y, and Z directions
Weight	1 kg max.
Degree of protection (front panel)	Equivalent to IP65 oil-proof type and NEMA4 (See note.)

Note: The equipment cannot be used for long periods of time in locations which expose the panel to spills of oil.

■Display/Panel Specifications

Item \ Model			NT31-ST123(B)-EV3	NT31C-ST143(B)-EV3
Display	Display device		Monochrome STN LCD	Color STN LCD
	Number of dots (resolution)		320 dots (horizontal) x 240 dots (vertical)	
	Effective display area		118.2 x 89.4 mm (5.7 inches)	
	View angle		Up: 20° Down: 40° Left/Right: ±45°	Up: 30° Down: 50° Left/Right: ±50°
	Display color		Black/White (2 colors)	8 colors (intermediate colors can be displayed in tiling patterns)
	Service life		50,000 hours (until contrast is reduced by 50%)	
	Automatic turn-OFF		1 to 255 minutes/None	
	Contrast adjustment		100 levels of adjustment possible using the front touch panel	
Backlight (cold cathode tube)	Service life (when brightness is set to high)		50,000 hours min. (See note.)	
	Brightness adjustment		3 levels of adjustment possible using the front touch panel	
LED	POWER	Green	Lit while power is being supplied	
	RUN	Green	Lit during operation	
		Orange	Lit when the battery voltage is low (when operating)	
		Red	Lit when the battery voltage is low (when stopped)	

Note: The time until brightness is reduced by half, under normal temperature and normal humidity.

■Operation Specifications

Item \ Model		NT31-ST123(B)-EV3/NT31C-ST143(B)-EV3
Touch panel	Number of switches	192 (16 x 12)
	Input	Pressure sensitive
	Operating force	1 N max.
	Service life	1,000,000 operations min.

■External I/F Specifications

Item \ Model		NT31-ST123(B)-EV3/NT31C-ST143(B)-EV3
Serial communications	Serial port A	Conforms to EIA RS-232C D-sub 9-pin connector (female) +5 V (250 mA max.) output at pin No. 6
	Serial port B	EIA RS-232C (RS-422A/485 selectable by memory switch setting) D-sub 25-pin connector (female)
Parallel I/F		Conforms to Centronics specifications, 20-pin half-pitch connector
Expansion I/F		Dedicated connector

■Display Specifications

Item \ Model		NT31-ST123(B)-EV3/NT31C-ST143(B)-EV3
Display elements	Character displays (fixed display)	65,535 per screen (including marks)
	Graphic displays	
	Character string displays	Up to 256 per screen (40 bytes (40 characters) per string)
	Numerical displays	256 per screen, max. 10-digit display (2 words)
	Bar graph displays	Up to 50 per screen, percentage display and sign display are possible
	Analogue meter	Up to 50 per screen, percentage display and sign display are possible.
	Trend graphs	One frame per screen, 50 graphs per frame (only 8 graphs per frame with data logging)
	Broken line graphs	One frame per screen, 256 graphs per frame, 320 points per graph
	Lamps	Up to 256 per screen
	Image library displays	Up to 256 per screen
	Touch switches	Up to 256 per screen, Max. overlap: 256 mesh
	Numeral inputs	Up to 256 per screen
	Thumbwheel switches	
	Character string inputs	Up to 256 per screen
	Alarm lists	Up to 4 groups per screen
	Alarm histories	
Screen types	Normal screen	The normal screen display
	Overlapping screens	A maximum of 8 registered screens can be displayed overlapped with each other.
	Window screens	Up to 3 screens (2 local windows and 1 global window) can be displayed at the same time.
	Display history screens	Order of occurrence (max. 1,024 screens), order of frequency (max. 255 times)
Screen attributes		Buzzer, display history, background color, backlight, keyboard screen number
Number of screens	Max. number of registered screens	3,999 screens
	Screen No.	0: No display 1 to 3999: User-registered screens 9000: "Initializing system" screen 9001: Display history (occurrence order) screen 9002: Display history (frequency order) screen 9020: Programming Console function screen 9999: Return to the previous screen 9021 to 9023: Device monitor
Screen registration method		By transmitting screen data created using the Support Tool to the NT31/NT31C By transmitting screen data stored in a memory unit to the NT31/NT31C (automatic/manual)
Screen saving method		Flash memory (screen data memory in the PT)

■Display Element Specifications

Item \ Model	NT31-ST123(B)-EV3	NT31C-ST143(B)-EV3
Display characters	Half-size characters (8 x 8 dots): Alphanumerics and symbols Normal-size characters (8 x 16 dots): Alphanumerics and symbols Mark data (16 x 16 dots): User defined picture characters	
Enlargement function	Normal size, double width, double height, and magnifications of 4X, 9X, 16X, 64X	
Smoothing processing	Available for enlarged characters with magnification of 4X or greater (excluding marks)	
Character display attribute	Normal, reverse, flashing, reverse and flashing, transparent	
Image data	Variable-size pictograph Size: Min. 8 x 8 dots, Max. 320 x 240 dots The size can be set in 8-dot units. It is not possible to set enlarged display, smoothing processing, or display attributes such as reverse/flashing.	
Library data	Combination of any characters and graphics Size: Min. 1 x 1 dots, Max. 320 x 240 dots Any size can be set. Enlarged display, smoothing processing, and display attributes such as reverse/flashing are displayed according to the setting registered.	
Graphics	Polyline, circle, arc, fan, square, polygon	
Line type	Solid line, dotted line, alternate long and short dash, long and two short dashes (only polylines for other than solid lines)	
Tilling	10 types	
Graphic display attribute	Normal, flashing, reverse, reverse flashing	
Display colors	2 colors (black/white)	8 colors (black/blue/red/purple/green/light blue/yellow/white)

■Data Capacities

Item \ Model	NT31-ST123(B)-EV3/NT31C-ST143(B)-EV3
Screen data capacity	1 MB
Numeric memory table	2 words x up to 2,000 (1,000 tables can be backed up with battery)
Character string memory table	40 normal-size characters x up to 2,000 (Data can be written to and read from 500 tables)
Bit memory table	1 bit x 1,000
Mark data	224 (16-by-16-dot basis)
Image data	4,095 items
Library data	12,288 items

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NT20

General Specifications

Item / Model	NT20-ST121(B)/128(B)
Rated power supply voltage	24 VDC
Allowable power supply voltage range	20.4 to 27.6 VDC (24 VDC −15%/+10%)
Allowable power interruption time	Not specified
Power consumption	10 W max.
Ambient operating temperature	0 to 50°C (See note 1.) (with no condensation)
Storage temperature	−20 to 70°C
Ambient operating humidity	35% to 85 % (0 to 40°C) 35% to 50 % (40 to 50°C) (with no condensation)
Ambient storage humidity	35% to 85 % (−20 to 40°C) 35% to 50 % (40 to 50°C) 35% to 45 % (50 to 70°C) (with no condensation)
Ambient operating environment	No corrosive gases
Noise immunity	Conforms to IEC 61000-4-4 at 2 kV (power supply line).
Vibration resistance (during operation)	5 to 9 Hz, single amplitude: 3.5 mm 9 to 150 Hz, 9.8 m/s^2 10 times (1 octave/min) each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s^2 , 3 times each in X, Y, and Z directions
Dimensions	190 x 108 x 53.5 mm (W x H x D)
Panel cutout dimensions	178.5 + 0.50 X 98.5 + 0.50 mm (horizontal X vertical) Panel thickness: 1.6 to 4.8 mm
Weight	0.7 kg max.
Degree of protection	Front panel operating section: Equivalent to IP65 oil-proof type and NEMA 4. (See note 2.)
Applicable standards	UL 1604 Class 1 Division 2, EC Directives

Note 1: The display quality (e.g., contrast) will deteriorate at temperatures above 40°C. At low temperatures, the response speed will be reduced due to the characteristics of liquid crystal.
2: The NT631/NT31/NT20 may not be able to be used in locations subject to long-term oil exposure.

Display/Panel Specifications

Item		Specifications
Display (See note 1.)	Display device	Monochrome STN LCD (with backlight)
	Number of dots (resolution)	140 (128) X 260 (256) dots (horizontal X vertical) Dot size: 0.42 mm The number of dots that can be used in NT20 system programs is indicated in parentheses.
	Effective display area	66 (57.6) X 120 (115.2) mm (horizontal X vertical) The effective display area that can be used with NT20 system programs is indicated in parentheses.
	Display mode	Blue mode
	View angle	Left/right: ±35°, Up: 40°, Down: 50°
	Service life	50,000 hours min.
	Contrast adjustment	The contrast can be adjusted from the back of the PT.
Backlight (cold cathode tube)	Service life	50,000 hours min. (See note 2.)
	Replacement	Cannot be replaced.
	Brightness adjustment	Cannot be set.
	Automatic turn-OFF	Can be set to either 10 minutes, 1 hour, or lit.
Front-panel indicator LED	RUN	Lit green: Normal operation with Memory Unit automatic transfer completed. Flashing green: Executing Memory Unit automatic transfer or automatic transfer error.

Note 1: There are sometimes faulty in the touch panel, but this does not indicate an error as long as the number of bright or dark pixels does not exceed the following limits.
4 total bright or dark defects maximum of the following size with no more than one per 20-mm square: 0.2 mm < (short dia. + long dia.)/2 < 0.55 mm
2: This time is only a guide to the half-life of luminescence at room temperature and standard humidity. The service life will be dramatically reduced in low-temperature environments. For example, the service life at 0° or less is approximately 10,000 hours (reference value).

Operation Specifications

Item	Specifications
Touch panel	Number of switches: Up to 72 registered per screen (12 x 6 (horizontal x vertical))
	Switch size: 9.14 x 9.18 mm (horizontal x vertical)
	Input: Pressure sensitive
	Operating force: 1 N max.
	Service life: 1,000,000 operations min.

External I/F Specifications

Item / Model		NT20-ST121(B)
Serial communications	Serial port A	Conforms to EIA RS-232C. D-sub 9-pin connector (female) +5 V (150 mA max.) output at pin No. 6 The +5 V output, however, cannot be used simultaneously at ports A and B.
	Serial port B	EIA RS-232C D-sub 9-pin connector (female) +5 V (150 mA max.) output at pin No. 6 The +5 V output, however, cannot be used simultaneously at ports A and B.
Expansion I/F		Dedicated connector

Display Specifications

Item		Specifications	
		Host Link, NT Link, or C200H Direct Communications	Memory Link (RS-232C) Communications
Display elements	Display characters	Fixed displays (character strings registered for each screen)	
	Character string displays	32 per screen	128 per file, 32 per screen
	Numeric displays (See note.)	50 per screen max., 8-digit display	
	Bar graph displays (See note.)	50 per screen	
	Graphic displays	Any position	
	Lamps	128 per screen	256 max. per file
	Touch switches	72 per screen	256 max. per file
	Numeral settings	Numeral setting display (8 digits), 50 per screen	
Screen types	Normal screen	The normal screen display	
	Overlapping screens	A maximum of 8 registered screens can be displayed overlapped with each other.	
	Continuous screens	Switch among up to 8 screens (Use ↑ and ↓ touch switch keys to switch screens.)	
Screen attributes		Buzzer, numeral settings, backlight	Buzzer, numeral settings, backlight, bit inputs
Number of screens		495 screens max.	
Screen registration method		By transmitting screen data created using the Support Tool to the NT20 By transmitting screen data stored in a Memory Unit to the NT20 (automatic/manual)	
Screen saving method (image data memory)		Flash memory (specific NT20 format)	

Note: No. of numeral table entries that can be used (No. of numeral displays used + No. of graphs used + No. of numeral settings) ≦128

Display Element Specifications

Item	Specifications
Display characters	Half-size characters (8 x 8 dots): Alphanumerics and symbols
	Normal-size characters (8 x 16 dots): Alphanumerics and symbols
	Mark data (16 x 16 dots): User defined picture characters
Enlargement function	Double width, double height, and magnifications 4X, 9X, 16X
Smoothing processing	Available for enlarged characters with magnification of 4X or greater
Character display attribute	Normal, reverse, flashing, reverse and flashing
Graphics	Polylines, circles

Data Capacities

Item	Specifications	
	Host Link, NT Link, or C200H Direct Communications	Memory Link (RS-232C) Communications
Character strings	32 characters x 128	
Numeral data	8 digits x 128	
Mark data	64	
Touch switches	No limit	256 per file max.
Lamps	No limit	256 per file max.

Dimensions/Ordering Information

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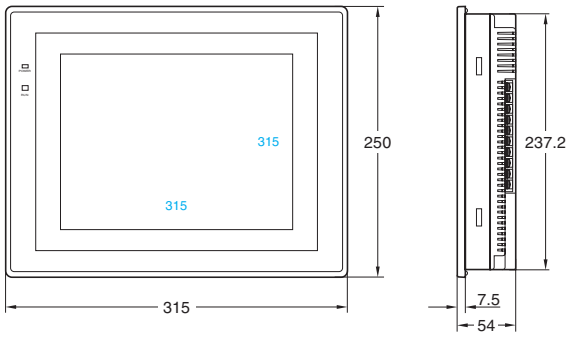
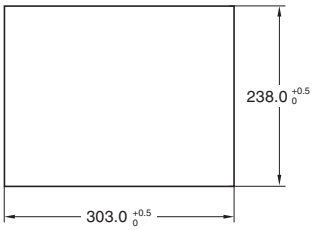
■ Dimensions

(Unit: mm)

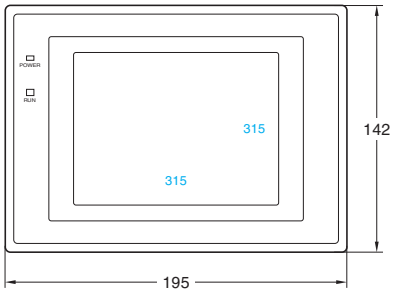
NT631C

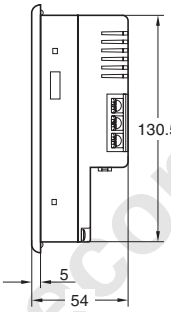


● Recommended Panel Cutout Dimensions

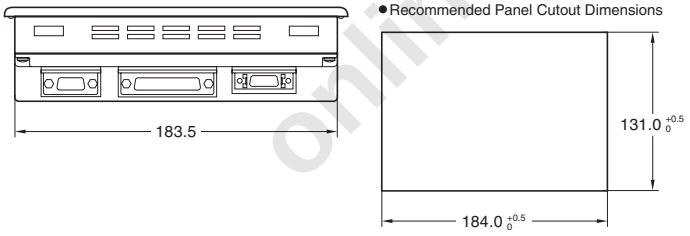


NT31/NT31C

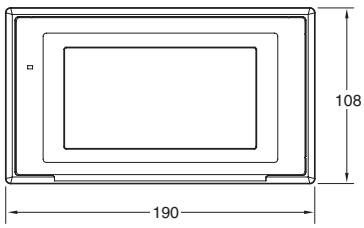


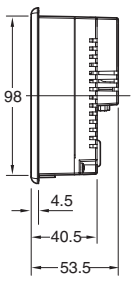


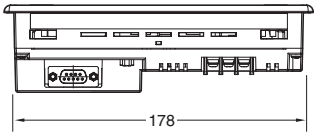
● Recommended Panel Cutout Dimensions



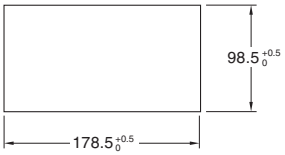
NT20







● Recommended Panel Cutout Dimensions



■ Ordering Information

Item	Specification		Model	Standards
NT631C	TFT color	Frame color: beige	NT631C-ST153-EV3	CU, CE
		Frame color: black	NT631C-ST153B-EV3	
NT31/ NT31C	STN color	Frame color: beige	NT31C-ST143-EV3	
		Frame color: black	NT31C-ST143B-EV3	
	STN monochrome	Frame color: beige	NT31-ST123-EV3	
		Frame color: black	NT31-ST123B-EV3	
NT20	STN monochrome	Frame color: beige	NT20-ST121-E	
		Frame color: black	NT20-ST121B-E	
Support Software	English	Windows 98, NT, 2000, Me, or XP (provided on CD-ROM)	NT-ZJCMX1-V4	—
			NT-ZJCAT1-EV4	
	Memory Unit for Screen Transfer	NT631C/NT31□/NT20 (common)	NT-MF261	
Cable	For screen transfer	For IBM PC/AT or compatible (2 m)	XW2Z-S002	
	Printer	For hardcopies of screens	NT-CNT121	
Option	DeviceNet Interface Unit		NT-DRT21	U, C
	Anti-reflection Sheets (surface only)	NT631C (5 sheets)	NT610C-KBA04	—
		NT31/31C (5 sheets)	NT30-KBA04	
		NT20 (5 sheets)	NT20-KBA04	
	Protective Cover	NT631C (5 sheets)	NT631C-KBA05	
		NT31/31C (5 sheets)	NT31C-KBA05	
		NT20 (5 sheets)	NT20S-KBA05	
	Chemical resistant cover (silicon cover)	NT631C	NT625-KBA01	
		NT31/NT31C	NT30-KBA01	
		NT20	NT20-KBA01	
	Battery	NT631C/NT31□/NT20 (common)	C500-BAT08	
	Bar-code Reader	Refer to the Catalog for details.	V520-RH21-6	
	RS-422A Converter	For NT20 ports A and B	CJ1W-CIF11	CU, NL, CE
	Interface Attachment	For NT20	NT20-IF001	—

■ Communications Cable between PT and PLC

PT end		PLC end	Cable length	Cable model	Standards
D-sub 9-pin connector	NT631C port A or B NT31/NT31C port A NT20 port A or B	D-sub 9-pin connector	2 m	XW2Z-200T	—
			5 m	XW2Z-500T	
		D-sub 25-pin connector	2 m	XW2Z-200S	
			5 m	XW2Z-500S	
D-sub 25-pin connector	NT31/NT31C port B	D-sub 9-pin connector	2 m	XW2Z-200S	
			5 m	XW2Z-500S	
		D-sub 25-pin connector	2 m	XW2Z-200P	
			5 m	XW2Z-500P	

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Differences between the NT20, NT20S, and NT20M

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Function	NT20M-DT131	NT20S	NT20
Communications	A host interface unit is needed.	•NT20S-ST121-V3: Built-in Host Link/NT Link •NT20S-ST122-V1: Built-in C200H Direct Communications •NT20S-ST128: Built-in Memory Link (RS-232C) (Other host interface units cannot be connected.)	System programs can be downloaded using the System Installer. •Host Link, NT Link, C200H Direct, and Mitsubishi Communications pre-installed: NT20-ST121 •Memory Link (RS-232C) is provided with a different system program.
Communications connectors	Connector on front panel for connection to Support Software (9-pin) and connector on rear panel for connection to host	•NT20S-ST121-V3/ST128: Connector (9 pin) for either Support Software or host •NT20S-ST122-V1: Connectors on rear panel for Support Software (9-pin) and host	Two communications connector ports (9-pin) on rear panel Port A: For either Support Software or host communications Port B: For host communications only
Host RUN input terminal/ Alarm output terminal	Yes	No	No
System keys	Yes	No	No
Contrast adjustment	Front panel	Rear panel	Rear panel
Expansion I/O Unit	Possible with DN type	Not possible	Not possible
Water resistance	Equivalent to IP54.	Equivalent to IP65.	Equivalent to IP65.
Allowable power interruption time	5 ms	Not specified	Not specified
System ROM	A system ROM compatible with the host interface unit is required.	Built in (cannot be replaced)	Built in (cannot be replaced)
Resume function	Yes	No	No
History holding function	Yes	No	No
Screen data compatibility	No	Yes (See note.)	Yes
PLC ladder program compatibility	No	Yes	Yes
LCD life	50, 000 hours min.	50, 000 hours min.	50, 000 hours min.
Backlight life (luminescence half life)	10,000 hours (replaceable)	10,000 hours (replaceable)	50,000 hours (replacement not required)
Image data memory	Sold separately (select EPROM, SRAM, or EEPROM)	Built in (flash memory)	Built in (flash memory)
Image data memory capacity	128 KB max.	96 KB	512 KB
Dimensions	220 x 110 x 82 mm	190 x 110 x 58 mm	190 x 108 x 53.5 mm (with no host interface)
Panel cutout	209 x 98.5 mm	178.50 x 100.5 mm	178.5 x 98.5 mm

Note: If screens require continuous screens, numeral settings, buzzer stop, or other system key functions, touch switches with the system key functions must be set for each screen using the Support Software. For details, refer to the *NT20S Programmable Terminal User's Manual* (Cat. No. V020).

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Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

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